

Intermontanus

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New Publications

A new bimonthly magazine devoted to reptiles, amphibians, and arthropods is about to appear in many Spanish speaking countries. *Reptilia* is the only herp magazine published in Spanish for herpetoculturists.

The main objectives of *Reptilia* are to spread information about the diverse aspects involved in keeping terrarium animals; to report on their natural history and thus facilitate the understanding of their needs; to encourage breeding; to give credible and easily understood veterinary information to amateurs and professionals alike; to offer information about legislation and regulation; to demythologize the world of these animals through knowledge of their relationship to different cultures; and to serve as a medium through which all interested parties can communicate.

The contents of the first issue are: Introducción a las técnicas terrario [Introduction to terrarium techniques]; Enfermedad metabólica de los huesos en Iguanas [Metabolic bone disease in iguanas]; Terrapenes mantenimiento y cuidados generales [Care and maintenance of tortoises]; El temido mundo de las serpientes venenosas [The feared world of venomous snakes]; Una mariposa para una reina, *Graellsia isabelae* [A butterfly for a queen, *Graellsia, isabelae*]; Chameleons [Chameleons]; Visita a Samutprakan, granja de cocodrilos en Thailandia; Sahona-mena, Mantellas; El terrario del Zoo de Barcelona [The terrarium at Barcelona Zoo]; Amiga araña, *Phrixotrichus roseus*; El lento avance de la tortuga mediterránea hacia su recuperación [The slow advance of the Mediterranean tortoise (*Testudo hermanni hermanni*) towards recuperation]; La ley que regula el tráfico de especies: CITES (1); and Alimento vivo. A poster of *Lampropeltis triangulum* is also included in the issue. It appears that each article will contain an abstract in English.

At the time of writing I do not have subscription information, but it can be obtained by writing: *Reptilia*, c/ Muntaner 88, 5^o 1^a, 08011 Barcelona, Spain. Not only will this magazine offer a new perspective on many different species not commonly kept in the US, it will facilitate communication with many Spanish speaking countries.

Science Press recently published a book by Ye Xiangkui entitled *Fossil and Recent Turtles of China*. The promotional information states: China possesses an abundant turtle fauna, both fossil and extant. It has a fossil record ranging continuously from early Jurassic to Quaternary, and the living ones are also flourishing. The present monograph describes systematically all the species of this animal group known in China before 1991. It offers not only the diagnosis, locality and horizon of every species, but also the related biogeography, evolution, comment, even revision etc. We believe that the data presented here will serve as a valuable reference in the study of turtles both in China and abroad. The book contains 112 pages and costs \$34.00 for the English edition.

Ralph Curtis Books recently published a book by Stephen Spawls and Bill Branch entitled *The Dangerous Snakes of Africa*. This fully illustrated guide to more than 90 species of dangerous snakes found in the African continent is the first attempt to combine such a wealth of herpetological, toxicological and related information. As well as providing as much detailed description, identification, and distribution data as possible, it also contains vital information on snakebite. The book consists of 192 pages with numerous color photographs and distribution maps, \$39.95.

The Nationaal Natuurhistorisch Museum in Leiden, The Netherlands, recently published T.C.S. Avila-Pires' book *Lizards of Brazilian Amazonia (Reptilia: Squamata)*. With 706 pages, taxonomic keys, dot distribution maps, numerous figures and illustrations, synonymies, and listings of museum specimens this book is certain to become a standard reference. Apparently only 250 copies were printed for resale. The cost is ca. \$160.00. For more information write: Dr. W. Backhuys, Universal Book Services, Warmonderweg 80, 2341 KZ Oegstgeest, The Netherlands.

François Le Berre's new book, *The New Chameleon Handbook* is now available. The book contains 128 pages and numerous color photographs. The cost is \$8.95. This book is available at several bookstores and pet stores.

All of the books mentioned in this section are available from Bibliomania. UtAH members receive a 10% discount.

Curiosity Corner

Stan Draper

Q.—"I just looked in my (insert your favorite reptile) cage and found a batch of eggs. What do I do now!?"

A.—This doesn't happen very often but when it does, time can be crucial. Hopefully the eggs are found soon after they were laid or as they are being deposited. Don't give up though if they are slightly dented. These dents will sometimes pop out during the first couple of days of incubation. Even if they don't, the eggs still have a good chance of completing incubation successfully. The next part of the initial inspection is to try and determine if the eggs are viable. The best clues are the color and texture. They should be a uniform white with a leathery feel. A yellowish tinge with a slimy touch indicates an egg that is infertile and should be thrown out.

Now that you have all good eggs it is time to get them incubating. You have several options for a medium to put around the eggs. The three most common mediums used are vermiculite, sphagnum moss and paper towel. With vermiculite (available at most nurseries), the most commonly used, you have to be careful not to get it too moist. The water to vermiculite ratio should be 1:1 by weight. This may not appear to be damp enough but vermiculite holds water well. Bury the eggs 1/2 to 2/3rds of the depth into the vermiculite. Try not to turn the eggs from the position in which they were found. Do not cover the eggs completely.

Green sphagnum moss, available at your local gardening outlet, soaked in water and then squeezed free of excess liquid also works well as an incubation and laying medium. Line the bottom of your container with a loosened layer of the moss. Place the eggs individually if possible or the clump of eggs on top of this layer, again same side up as they were found. Over this place a thin layer of very loosened moss.

Brown paper towel (unbleached) is also a satisfactory material for incubation. Again it is soaked in water and then wrung out. You want it damp, not dripping wet. A layer is placed in the bottom of your container. Next come the eggs and another layer of damp towel.

With all of these mediums, you can place a lid on the container to

help retain humidity. It is important to either have holes in this lid or open the lid every couple of days during the incubation to help with the exchange of oxygen and carbon monoxide. You also need to check the water content of your selected medium. The best way to add water is with a spray bottle. Try to keep water droplets off the eggs themselves or wipe them off after adding moisture.

Now the next crucial exponent, temperature. Depending on the type of animal that laid the eggs, the range of temperature is from 76-92 degrees Fahrenheit. Hopefully you have a source of information to find the correct temperature range for your particular species. Where you place the container of eggs to maintain the temperature can range widely. If you don't have a commercial or homemade incubator, you can find a warm spot in your house/apartment. This can be anything from the top of a fluorescent light fixture close to the ballast or near a space heater. A good thermometer is very crucial. Radio Shack has many models costing up to fifteen dollars.

If you want the space heater or light fixture to be temporary, a very economical plan for a homemade incubator is available in "Reproductive Husbandry of Pythons and Boas" by Ross and Marzec. This plan is very adaptable and very reliable with the double thermostat design.

Along with checking the moisture content of your clutch(es), you need to keep an eye open for fungus or mold growing on the eggs. This is best taken care of by wiping the surface with a paper towel. This should be at least an every other day task once you notice growth. You may have to wipe the eggs every day with bad cases.

Now what should you do if an egg goes bad during incubation? Signs of an egg going bad are discoloration, major collapse while the rest stay plump, or explosion. If the egg explodes, you need to clean

up and replace the medium. Again take special care to maintain the eggs with the same side up when transferring the good eggs. If the bad egg is attached, you can use a sharp instrument to cut away the major portion of the shell. Where it was connected to a neighbor, you will have to leave the attached part so as to not risk damaging another egg. With eggs that collapse or become discolored and are attached to good eggs, you have the option of leaving them with the batch. The other eggs can complete incubation with no ill effects from the "bad" egg. If the egg is just discolored compared to its mates and is not attached, you may want to place it in a container of its own. There have been cases of these eggs successfully hatching.

Now all you need is patience. Depending upon the species of egg, you may need a little or one heck of a lot. Some incubations can be as short as 30 days and others as long as 200 or more days. Each species usually has a set range of days at the optimum temperature range. If the temperature is lower or higher than optimum, the length of incubation can be longer or shorter. If the range is too extreme, then the eggs die. Another effect of low or high temperature is sex determination in some species, but that is a subject for another column.

If the unfortunate happens and this batch of eggs doesn't make it, you at least know that you have a viable female and possibly a fertile male. This knowledge will help you to prepare for the next batch of little white surprises. GOOD LUCK!!!!

We have received few questions for this section of the newsletter. Please send any questions about herpetology or herpetoculture to UtAH so that this column may continue to be an important part of the newsletter. Questions may also be called in to either Stan Draper (801) 364-5009 or Breck Bartholomew (801) 752-2097.

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HARRIET THE GALAPAGOS TORTOISE: DISCLOSING ONE AND A HALF CENTURIES OF HISTORY.

Scott Thomson¹, Stephen Irwin², and Terri Irwin²

Introduction

At the Queensland Reptile Park, Beerwah, near the Sunshine Coast of Queensland lives a lone female Galapagos tortoise known as Harriet (Fig. 1.). She's quite an attractive old girl weighing in at an estimated 180 kg, which is quite an impressive size for a female Galapagos tortoise. She spends her time soaking up the Queensland sun and is a major draw card at the Reptile Park. The authors all met each other in 1992 when one of us (ST) decided to attempt to identify all the Galaps in Australia and New Zealand to subspecies by determining their complete histories and using this to tie them to a collection site. We, therefore, owe our successful collaboration on this and a couple of other studies, for example Alligator Snapping turtles, to Harriet. It is with this in mind that we take the opportunity to write down the history of a tortoise who has plodded her way around the world since at least 1834. Unfortunately, it is not yet possible to prove her story and it is difficult not to get caught up in the excitement of it, but, the story we present is the most likely scenario based on the information we have. We will also attempt to reproduce the sequence of events which has led to the evidence we do have.

Gleaning out Harriet's history

Back in 1992 all we knew about Harriet was her recent history, where she had spent the last 40 odd years. Based on this and some morphometric analysis we felt she was probably a Santa Cruz tortoise (*Geochelone nigra porteri*) we had no idea where to look for her history and began by following her back from previous owner to previous owner.

Harriet arrived at the Queensland Reptile Park in 1987 from Fleay's Fauna Sanctuary. She already had quite a public life as David Fleay was a prolific writer and she featured prominently in Fleay's books. So where did David Fleay find Harriet? He found her in 1936 at the Brisbane Botanical Gardens and purchased her when they closed their zoo in 1952. David Fleay had very little success in locating Harriet's history but did record that she was here in 1870; we have no idea how David arrived at that date but do have a theory on it which we will discuss later. David did contribute significantly to Harriet's history in other ways, because of David her name is Harriet not Harry, when they realized that he was a she in the late 1950's. We also know where her name came from, she was named after Harry Oakmann, who was the Curator of the Brisbane Botanical Gardens and worked there for over thirty years. But nothing on where she came from.

We were able in time to speak to Harry Oakmann and he introduced us to one of Harriet's former keepers from when she was at the gardens. Both remember Harriet from as far back as the 1930's but didn't know where she came from. The records from the gardens were searched thoroughly for any evidence and we were able to push the confirmed date back a little further, 1893, to the great flood of Brisbane. The newspapers of the day show people

sculling down the main street of Brisbane and for weeks the "Courier Mail", a newspaper in Brisbane, started each edition by thanking the Sydney Morning Herald for printing their papers on their behalf, as their Brisbane office was under some five meters of water. This also spelt the end of the Brisbane Botanical Gardens' records as they were all destroyed in the flood.

At this point we thought the search would be lost to time, we had envisaged reading newspaper after newspaper going backwards in the hope that we could find some mention of her arrival in Australia. We never, thankfully, got around to this, can you imagine trying to

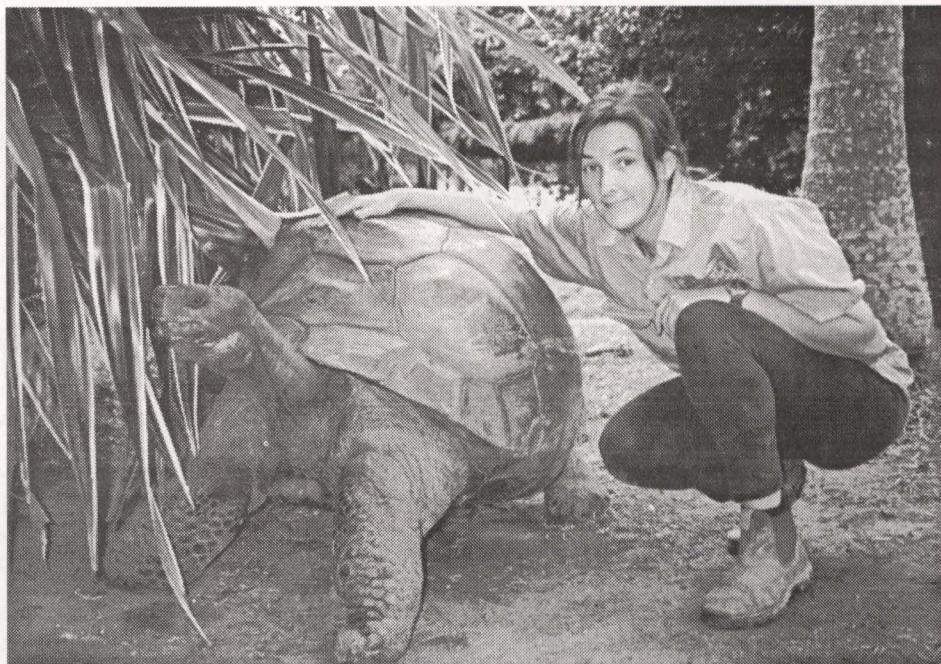


Fig. 1. Harriet at the Queensland Reptile and Fauna Park.

find words to the effect of "tortoise arrived" in some 100 years worth of daily newspapers!

The sequence of events that actually uncovered her history were so remarkable that saying that we were a little shocked by it all would be understating the reality and the fact remains that this chain of events is still happening as we speak. On 6 July 1994 the "Sunday Mail" ran a story on the plight of Lonesome George the last of the Pinta Island tortoises (*Geochelone nigra abingdoni*) entitled "Lonesome George - The last of his breed", this story had absolutely nothing to do with Harriet but it was the trigger. An old retired historian by the name of Ed Loveday from Mareeba in north Queensland thought he would write a letter to the editor mentioning his recollections of the three, not one, tortoises at the Brisbane Botanical Gardens. We have reproduced his letter in full with this paper (Box 1).

So now we had some names of people, some dates, a starting point at last. In the next two weeks the information systems were extensively searched for collaborative information. Ed Loveday's earliest recollection of the tortoises, he only ever saw two as one died last century, was in 1922 when he visited the gardens frequently with his parents. Upon interviewing him some more information

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TORTOISE RECALLED

The sad story of "George", headed "Last of his kind" in the Sunday Mail (July 6), reminded me there were once three Galapagos tortoises living in the old Brisbane Botanical Gardens.

In my time, from about 1922 onwards, there were only two still living. I was told they were brought to Brisbane by Captain Wickham, the Government Resident at Moreton Bay around the middle of last century.

Wickham had accompanied Charles Darwin on the "Beagle" on his research voyage around the world and spent some time at the Galapagos Islands gathering scientific material for Darwin's classic work "Origin of the Species."

It is quite probable that Wickham took the three specimens from there¹ and later installed them in the Botanical Gardens where I saw them several times.

Eventually all died, the last one fairly recently².

Sadly, they did not reproduce; I never heard of this anyway. Perhaps they were too old when coming to Brisbane, or were of the same sex or they enjoyed the lush Botanical Gardens conditions and did not bother about that.

Certainly they were early residents of Old Brisbane Town. They were very long lived.

Perhaps others of your readers could add to this reminiscence.

E.M. Loveday, PO, Mareeba.

¹Wickham never actually made it to Galapagos, the crew of the "Beagle" Expedition went their separate ways in South America. See "Voyage of the Beagle".

²As mentioned in the main article, the recent large tortoise that died was from another part of Queensland and was not a Galap.

Box 1. "Letter to the Editor" written by Ed Loveday from Mareeba, Qld. "Sunday Mail" 7 August 1994.

was gained. The last time he remembered seeing two tortoises at the gardens was between 1925 and 1930, i.e. six years before Harry Oakmann or David Fleay ever saw Harriet. I assumed that the other animal died and was probably buried or dumped somewhere. We were also able to ascertain that the tortoise Ed had thought died recently was a very old Red-footed tortoise (*Geochelone carbonaria*) which died around 1986. Out of necessity we reevaluated the previous morphological identification and concluded that Harriet could be a Santiago tortoise (*Geochelone nigra darwini*) as females of this population and the Santa Cruz population are virtually indistinguishable.

Charles Darwin and John Clements Wickham had crept into the picture now and this gave our first real information. If you want to look at animal's in history there is only one sure way to obtain accurate and continuous information, attach the animal to a famous person and follow the person through history. Therefore the history of all the people who could have been associated with Harriet was studied; Darwin, Wickham, Gray, Bell, to name a few. But also places, Darwin's home; Wickham's home, Newstead House and the Oxford University which has some of Darwin's specimens. We also found out that some old city records from Brisbane, before the flood, are possibly stored at the John Oxley Library in Brisbane, but to date we haven't had time to look.

In September of 1994 we were all in Brisbane for a meeting of the Taxon Advisory Group and one of us (ST) was actually going to try and visit the John Oxley Library to have a dig. First, however, I went to the Brisbane Museum to look at a few specimens of Australian turtles, what I eventually found there left no time for the John Oxley Library. Patrick Couper, the Collection Manager there, mentioned to me that they actually had a large tortoise and that it was listed as an Aldabran (*Geochelone gigantea*). I lifted the lid it was a fully spirit

preserved tortoise, genus *Geochelone*, but it was on its back and from what I could see, essentially the plastron, I thought it might be a very large Yellow-footed tortoise (*Geochelone denticulata*) or something. So we went back up to Patrick's office and looked up the records, apparently this tortoise was given to the Museum by the Brisbane Botanical Gardens and was lodged (not necessarily received) in 1941. I'm fairly certain I beat Patrick back to the spirit room.

This time we pulled it out of the tub and righted it so that the animal could be viewed properly. The most significant thing we saw was painted on its back: "**Tom Galapagos tortoise Died 1929 Brisbane Botanical Gardens.**" A close inspection of the specimen brought an even more startling identification. Morphological identifications of Galapagos tortoises are always dubious but this one, a female, had some features which may give a reasonable identification. This was a small Galap, about 80 cm straight carapace length, it was a domed form, and yet if it was one of the Botanical garden animals it had to be fully grown as it was at least 60 years old going by David Fleay's earliest arrival date. It was a very healthy tortoise in its growth form, nice and symmetrical, no bossing of the scutes, no obvious deformities. This animal would appear to be a San Cristobal Tortoise (*Geochelone nigra cathamensis*) and by this I mean the extinct one from the south of San Cristobal not the half saddleback form (actually a new subspecies not *G. n. cathamensis*) from the north of the island that they find there now. The wild population of this subspecies disappeared at the turn of the century, the other population was found in the 1950's. Most important of all was that the very existence of this specimen verified part of Ed Loveday's story.

The following day at the Taxon Advisory Group meeting we were actually announcing, for the first time, that we had some information

CHRONOLOGY

ca.1830-1834	Harriet hatches on Isla Santiago (known at the time as James Island) and the first railway was built in the U.S., the Baltimore and Ohio.
1835-1836	Harriet is collected by Charles Darwin and taken to England and in the U.S. Oberlin College was the first coeducational college.
1841	Wickham retires from the Royal Navy and moves to Australia, brings three tortoises with him. Lives at Newstead House.
1845	State of Texas is annexed by Congress, results in the Mexican War.
ca. 1860	Probable time when the three tortoises were placed in the Brisbane Botanical Gardens as Wickham soon left Australia for France. Abraham Lincoln was elected as President.
1870	Six years before the invention of the telephone we have the earliest first hand account of Harriet.
1929	Tom dies and is placed in the Queensland Museum at the time of the U.S. stockmarket collapse.
1952	Harriet moves to Fleay's Fauna Sanctuary during the Korean war.
1987	Harriet moves to the Queensland Reptile Park at about the time that Vincent Van Gogh's painting "Irises" sells for \$54 million in New York.

Box 2. A chronology of the life of Harriet put against some significant events from human history.

concerning Harriet's history, a rather hasty adit was made about Tom. Since the meeting numerous press releases were made in the hope of obtaining further information from the public, with some success. From all the recent information we were able to deduce how David Fleay arrived at the 1870 date of arrival. We suggest that it was actually the earliest date that he could find first hand evidence that she was actually there. We have first hand evidence going back some 73 years from 1995, David first started studying Harriet in 1936, if he was also able to go back about 70 years, then he would achieve a date of around 1870.

So where are we at the moment? We know that Darwin collected from three populations; Santa Maria tortoise (*Geochelone nigra nigra*), San Cristobal tortoise (*Geochelone nigra cathamensis*) and the Santiago tortoise (*Geochelone nigra darwini*). Based on Darwin's notes all the tortoises collected were juveniles and based on the few sizes given they were probably between one and five years old. We have an account that the three original tortoises were brought to Australia by John Clements Wickham when he moved to Australia and became First Government Resident of Moreton Bay. Wickham was

the First Lieutenant of the Beagle under Capt. Fitz Roy, and later Captain of the Beagle. Wickham never went to the Galapagos so he had to obtain the tortoises off somebody else, the most likely person would be Darwin.

Currently we are having mtDNA analysis done to confirm the identifications of Harriet and Tom. Tom as a preserved specimen may not work but we feel that he is worth the risk to try anyway. This will be done by Ed Louis of Texas A & M University. We still have to get to the John Oxley Library and Ian Swingland is looking into things from the English end. Well, this is how the story unfolded so far. The difficult thing to conceive is Harriet's age, to bring this into perspective we have constructed a chronology (Box 2). To do this we interweave some significant human events into a chronology of events Harriet went through, assuming the story is correct. The last time this was done using Australian history but as this paper is being published in the U.S.A. we thought we would use some American history and this will hopefully put it all into a human perspective. Afterall, just imagine being some 165 years old!!



SNAKEBITE ENVENOMATION: FOLKWAYS TO ADVANCEMENTS IN TREATMENT

Adam Marfisi

Mankind, in his efforts to constantly reevaluate and change his status in the world, has often come into conflict with nature and many of its inhabitants. The venomous snake has been one of his small, but potentially damaging rivals. Naturally, the frightening and life-threatening consequences from snakebite envenomation calls for an antidote or cure.

The arrival of the nineteenth century led to the expansion westward and it is here that the settlers came in contact with the majority of the venomous snakes of North America. Most of the antidotes that were used at that time were rooted in folklore. "Folk medicine, like folklore, transcends both science and education and tends to derive its remedies from the simple people of each culture, people who, in time past, lived closest to nature... Such peoples seek refuge in those things they assume to be inherent in nature, which possibly appear [rational] to them. They may create a remedy from an inaccurate observation or a misinterpretation" (Russell, 1980). These folk remedies were largely ineffective, and at times completely hazardous to the victims' health. Some of the treatments prescribed were immersion in ice, consumption of alcohol, cures derived from the snake, and botanical based cures, most of which only complicated the situation and usually ended up with amputation of the bitten extremity after the onset of gangrene. Scenarios such as these led to widespread fear and misunderstanding of the snake in general. Attitudes taken by our ancestors completely overlooked the importance of a vital predator perfected through evolution and seated in its own biological niche.

In the present we know that snakebite envenomation is a medical emergency calling for immediate treatment with antivenom (also known as antivenin). This antidote reverses the actions of the proteins and enzymes introduced when bitten. The activity of the venom led one herpetologist to compare it to a grenade exploding in the body with pieces of protein and enzyme based shrapnel hitting and effecting various sites at once. The venom rarely, if ever, is as local as a bee or wasp sting. This recognition was paramount. Doctors would then administer antivenin to counteract the symptoms of the bite throughout the entire body instead of trying to treat it locally.

Antivenin is conventionally produced when horses are inoculated with harmless amounts of a snake's or a particular group of snakes'

venom. These horses subsequently build up an immunity by producing antibodies. The serum is then drawn and processed to purify the antibodies. The product is then given intravenously to the victim. The slang term "horse serum" was derived to describe this process (Weiss, 1990). Antivenin, even after five or six decades, is still the most trusted and commonly used method in controlling snake envenomation.

Dangerous complications, however, can arise from this form of treatment. According to Weiss (1990), extraneous proteins that have the signature sequences that identify them as horse derived have no therapeutic value and can trigger serious reactions when injected into a human. The body recognizes these proteins as foreign and the vast majority of the victims develop a degree of a frenzied immune response called serum sickness. Another potentially lethal consequence of the administration of horse derived products is anaphylactic shock. This is an extremely dangerous over sensitivity to the antidote. The symptoms are easily recognized by immediate flushing and the patients' inability to breathe. Sensitivity of this degree can usually be detected through a skin test resulting in either a positive or negative diagnosis. Should the patient have a positive response, the physician has to decide between the risk of anaphylactic shock or the chance of death from the bite. This highly anxious situation can be even more traumatic, given that this over-reaction can occur simply from the skin test itself.

At present, scientists and physicians are working on more effective ways to achieve the necessary antibodies without the tendencies for the harmful side effects of horse serum. Two groups of herpetological researchers are currently working on immunity in chicken eggs and producing antibodies in sheep. These studies could possibly be "the light at the end of the tunnel". The chicken eggs and sheep antibodies, due to the introduction of the enzyme Papain, would exclude the unnecessary part of that particular antibody causing serious reactions in the horse serum. Purification of the antibodies are also state-of-the-art, which adds to the efficacy of the new systems (Weiss, 1990).

In Australia, where the number of venomous snakes outnumbers the rest of the herpetofauna combined, scientists have isolated a protein in an extremely toxic elapid, the Tiger Snake (*Notechis scutatus*). They believe this protein keeps the snake from poisoning itself. This isolated factor inhibits toxic properties found in the snake's own venom. Researchers have termed it the *Notechis scutatus*

inhibitor or NSI (Dayton, 1993). NSI has been tested on several other venomous snakes namely the forest cobra (*Naja melanoleuca*), the Russell's viper (*Vipera russelli*), the urutu (*Bothrops alternatus*), the cantil (*Agkistrodon bilineatus*), and the western diamondback rattlesnake (*Crotalus atrox*) (Dayton, 1993). Consequently, each of these venoms were successfully neutralized by this protein. The fact that all of the above species range from Asia to Africa to the Americas, suggests that this could be a revolutionary breakthrough.

Another form of treatment, electric shock, has science somewhat befuddled. The medical community is confounded at how exactly the electricity nullifies the action of the venom. Dr. Ronald Guderian (1986), an American missionary physician, working in the Amazon rainforests of Ecuador has treated at least 34 Indians bitten by snakes presumed to be of the genera *Bothrops* or *Lachesis*. The subjects were all given repeated shocks from a stun gun. Reportedly, the bleeding stopped and there was a decrease in swelling with no further pain (Hardy, 1992). This is admittedly strange since envenomations from the fer-de-lance (*Bothrops atrox*, *B. asper*) and the bushmaster (*Lachesis muta*) are known for presenting extensive morbidity and relatively high mortality rates. Some physicians do theorize that the electricity has an effect on the venom itself by breaking down important deleterious aspects (Hardy, 1992). Many snakebite experts suggest caution and do not recommend electroshock until further testing is performed in the laboratory (Hardy, 1992).

There is no question, snake venom poisoning is a medical emergency deserving prompt and professional attention. Anyone bitten by a snake they believe to be venomous should seek medical attention immediately. Identification of the snake is of extreme importance. Hopefully, with the advancements that are being made in antivenin production, the foreboding presence of serum sickness and shock will become a fear of the past. Also, maybe people will then reevaluate their prejudices and take a second look at one of nature's most exquisitely designed and valuable predators.

Literature cited

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WESTERN LEAFNOSE SNAKE, *PHYLLORHYNCHUS DECURTATUS PERKINSI*: UTAH VOUCHER SPECIMEN

Russell Bezette

On July 11, 1995, at 2200 hrs., Russell Bezette and Jerry Le Grone were heading north on the Beaver Dam Slope road (old highway 95), from Littlefield, Arizona. The conditions were windy, 15 to 20 mph, air temp 29°C (84°F), 60% cloud cover with a full moon. It had sprinkled lightly during that same day. Approximately 1.5 miles past the Utah/Arizona border in Utah (elevation 2,400 ft), a snake was seen on the shoulder of the road. Upon examination and much to their surprise and delight, the snake turned out to be a freshly killed (presumably by an automobile) leafnose snake. The specimen was placed in a muslin bag and taken to the residence of Russell Bezette in La Verkin, Utah and placed in a refrigerator. Early the next morning Breck Bartholomew was contacted in Logan, Utah and it was decided to freeze the specimen until proper preservation could take place. R. Bezette took photographs and keyed out the specimen to be a male Western leafnose snake, *Phyllorhynchus decurtatus perkinsi*.

Color of the specimen—The background color on the rear half of the back is pinkish-buff turning slightly lighter on the forward half, the tail is slightly pinker than the background color of the rear half. On the body to the vent are 34 saddle spots of pecan brown with darker

borders, one of the spots is broken into 3 spots. Along the sides are two rows of smaller spots with some of the spots blending into larger ones. These lateral spots are darker, much the same color of the border of the dorsal spots. The head is slightly pink mottled with olive gray, with a band of the darker brown color under and through the eyes. The ventral plates are white with iridescent reflections of pale vinaceous-pink.

Measurements— Snout-vent length 326 mm, tail length 57 mm, head length 12.5 mm. Ventral scales 174.

Editor's note: For many years now it has been rumored that Eric Coombs and two companions once found a leafnose snake in Nevada and "chased" it into Utah so they could say they found one in the state. Given the biology and habits of this species the story seemed highly unlikely. A few months ago I asked Eric Coombs about the story. As it turns out the snake that he chased into Utah was a Mojave rattlesnake (*Crotalus scutulatus*). Eric also indicated that he never found a leafnose snake in Utah.

The specimen reported here is the first leafnose snake known from Utah. The animal has been deposited in the Brigham Young University collection BYU # 45605).

P.O. Box 668, La Verkin, UT 84745, USA



Western Leafnose snake (*Phyllorhynchus decurtatus perkinsi*) drawings reproduced from Schmidt & Davis. 1945. *Field Book of Snakes of the United States and Canada*. G.P. Putnam's Sons, New York, 365 pp.

A REVIEW OF TEN HERP MAGAZINES

Joel R. Eidbo

I am old enough that I used to keep reptiles in metal-sided aquarium tanks with sand or newspaper substrate. My friends and I used to get what information we could from trial and error, or from the various newsletters published by regional societies. The newsletters of the Chicago Herpetological Society and Northern Ohio Association of Herpetologists were the only sources we knew of. Today's cold-blooded caretakers have an entirely different problem; so many journals, magazines, and books are out there it's hard to decide what to buy.

I am by no means an expert herper. I just enjoy breeding and raising reptiles, and I try to make enough money selling the young to pay for the food and equipment. My main concern is not money, it's fun. With this in mind, I put together a list of the ten reptile and amphibian magazines most likely to interest people like me.

In Table 1 I list the magazines, their price, how often they are published, how many pages, how big, how many ads, etc. I also give letter grades to each for content, style and photography. For anyone's information, I subscribe to all of these ten magazines, and there is much to enjoy in each. I tried to approach this review by assuming that most people can't afford, or don't want to subscribe to everything! So after the table are brief reviews of each of the ten magazines.

Vivarium: The official publication of the American Federation of Herpetoculturists (is there an unofficial one?). The people who brought out *Vivarium* magazine in the winter of 1988 deserve enormous credit; they were the first to stick their necks out and publish a professional color magazine devoted solely to our cold-blooded friends. Back in those ancient times *Vivarium* was it! Even the early issues demonstrated a quality of content and photography that is unsurpassed today. Originally quarterly the magazine is now bimonthly with more pages. The staff do a good job in segregating the advertisements to keep the magazine readable. I have only a couple of complaints. First, they take themselves too

seriously. *Vivarium* yearns to bridge the gap between amateur and professional herpetologists by publishing natural history studies and the "field-trip of the month." I think they could thin this out a bit. Second, there has been too much space devoted to legislative and regulatory updates, a lot of which seem to center in California. It is of course an important topic, but couldn't they print it on regular paper, insert it into the magazine, and leave the glossy magazine pages for something else? These are minor grumblings, however, in what most of us consider the flagship herp magazine. If you can only subscribe to one herp-related magazine, this should be the one!

Reptile & Amphibian Magazine: A pocket-sized bimonthly general purpose magazine, *R & A* is the reader's digest of the herp world. It covers a wide range of topics, some in detail, some anecdotally, and some superficially. The quality of writing varies from topic to topic, as does the quality of photography. The most distracting problem with *R & A* (a problem shared by *Reptiles Magazine*), is advertising. Over half of the page space in an average issue is devoted to ads. It's hard to read *R & A* because the articles are spread out by so many ads, and by the small page size. I like *R & A* a lot, though, because they don't seem to take themselves too seriously. The magazine is a fun read, and overall is quite popular (try to find some of the early issues if you don't believe me!). There is a little something for everyone in *R & A*, and if you don't already subscribe, take a closer look!

Reptiles: A relative newcomer, *Reptiles* displays the best and the worst of our hobby. On the one hand, it's exciting to see a monthly, nationally distributed magazine on herps sitting next to *Time* on the news rack. Many of the articles are well-written and informative, and the photography and graphics are excellent. On the other hand, there is a lot of garbage, and celebrity drivel – does anyone really care about Slash and his reptiles?

Reptiles is a slick magazine, in every sense of the word. It's hard

Table 1. Comparison of ten herpetology/herpetoculture magazines. Letter grades are assigned to designate the quality of some aspects of the magazines. See text for additional discussion.

Frequency	Subscription price	Country of origin	Price/page*	Pages/issue	Pages of ads	# of color pages	# of B & W pages	Quality of graphics	Style	Photography	Content	Comments	
												Comments	
<i>Vivarium</i>	6	\$26.00	12¢	US	54	19	7	1	A	A	B+	A	Overall best
<i>Reptile & Amphibian</i>	6	\$16.00	8¢	US	126	62	18	1	C+	B+	B+	A	Reader's Digest for herps
<i>Reptiles</i>	12	\$28.00	3¢	US	132	65	23	4	B	B-	B	A	Slick, MTV-style
<i>Reptilian</i>	10	\$60.00	17¢	UK	42	6	12	1	B	B+	A	A-	Unique, friendly
<i>Monitor</i>	3	\$26.00	15¢	AU	62	5	4	6	C-	B	B	C	Amateurish, but improving fast
<i>Herpetofauna</i>	2	\$12.00	27¢	AU	44	0	2	2	B	A-	A	A	Technical, but readable
<i>Captive Breeding</i>	4	\$20.00	22¢	US	31	8	5	0	B	A	B	A	Under-rated, specialized
<i>Dactylus</i>	4**	\$20.00	27¢	US	40	3	6	0	A	B+	B+	A	Technical, readable, poor organization
<i>Iguana Times</i>	4	\$25.00	30¢	US	23	2	0	4	C	B+	A	C	Surprisingly good, reprints articles
<i>Tropical Fish Hobbyist</i>	12	\$30.00	23¢	US	11	–	3	0	C	C	C	B	Juvenile, superficial

* Adjusted to compensate for size and the number of ads in each magazine.

** Although scheduled as a quarterly publication, *Dactylus* is published at irregular intervals.

to justify a subscription price of \$28.00 when half of the magazine is ads. There are so many ads that they get in the way when you are trying to read. Iguanas, monitors, and other large lizards dominate the subject matter, I suppose catering to the interests of the casual reptile enthusiast. Quite a lot of amphibian matter is also included (note the small subtitle, *Reptiles and Amphibians*). *Reptiles* tries to reach out to the widest possible audience, with flashy covers, and busy graphics. At the same time they try to please the more serious hobbyist. A difficult challenge, but they succeed more often than not. For myself, there's a lot in each issue I skip, but also a lot I enjoy. It's kind of like the MTV guide to Herpetology.

Reptilian: A lot of people have told me they don't subscribe to this magazine because it's too expensive. But on a cost per page basis, *Reptilian* is the fifth cheapest on this list. *Reptilian* recaptures the joy of keeping herps as pets. In some form or other, all the other magazines and journals seem to lack the enthusiasm that abounds in *Reptilian*. Maybe it's the letter's page or the informal editorial in each issue, I can't put my finger on it, but I enjoy each issue and look forward to the next one. So often, it seems to me, there's an emphasis in America on the latest craze, the newest albino, the next weird crossbreeding, the current "investment-quality" commodity. I'm as guilty as anybody of all this nonsense, but it's refreshing to see another country's perspective. The writing is very good, and the photography is excellent. There are many color photos scattered from cover to cover. Advertisements are not so plentiful that they distract, as they do in *Reptiles* and *Reptile & Amphibian Magazine*. If I could only afford to subscribe to two magazines, *Reptilian* would be one of the two.

Monitor: An Australian journal geared more towards the amateur herper. *Monitor* comes out three times yearly, in a large format. *Monitor* and England's *Reptilian* are very similar in their approach. They both have a lot of husbandry articles and informal news roundups. The articles in *Monitor* are very readable and informative, and the range of topics is impressive. *Monitor* suffers from poor photography, with fuzzy black and white pictures throughout. A center section of excellent color photos is in each issue, but I question the logic of using color photographs to illustrate road-kill!?! Reminds me of an old Far Side cartoon. Hopefully, the future will bring more color, and better quality black and white photos. Once again, for the average enthusiast, *Monitor* may be too expensive and infrequent. The quality seems to be improving every issue, though. So for you Southern Hemisphere herpers, keep your eyes on this one!

Herpetofauna: *Herpetofauna* is another Australian journal. Published twice a year, it is small, about the same size as *Reptile & Amphibian Magazine*. There are no ads, just somewhat technical notes and articles with a few excellent color photographs. It is probably too expensive and infrequent for the average hobbyist. A lot of the technical stuff is over my head. But if you raise Australian herps, *Herpetofauna* looks like it will be a valuable reference tool.

Captive Breeding Magazine: It would be easy, with the explosion

of titles out there, to pass by *Captive Breeding Magazine*. After all, you can choose from *Reptiles*, *Reptile & Amphibian*, and *The Vivarium*; all three are well-known, and more widely circulated - why bother with this? Is there room for a fourth American Magazine? In a word, yes! *Captive Breeding* offers amateur and professional herp breeders a forum for discussing current and future breeding projects, often with beautiful color photographs. The quality is quite good and the writing practical and concise. The photography is usually excellent. It doesn't dwell on the myriad of laws and regulations, or on natural history and field trip experiences, or on in-the-news snippets. Just captive breeding, period! As long as the magazine stays focused on this one area, then it fills a valuable niche. If *Captive Breeding* tries to broaden its appeal, then it becomes redundant and unnecessary.

There has been some sloppy editing recently, which has resulted in the publishing of unfortunate and objectionable obscenities. Assuming that this doesn't recur, then I can recommend *Captive Breeding* to the serious hobbyist.

Dactylus: A focused journal of the International Gecko Society (IGS), *Dactylus* produces well-written, sometimes technical articles. The photography and graphics are usually excellent. *Dactylus* is published on an irregular and infrequent basis. It's a frustrating experience trying to figure out if your subscription has run out, or if the next issue is just late. The IGS makes it even more difficult, because they don't have a phone number where you can call to find out what's going on. In spite of this, if you are into geckos, or lizards in general, *Dactylus* is worth the often long wait between issues.

Iguana Times: Published quarterly, *Iguana Times*, much like *Dactylus*, is a specialized magazine. I was pleasantly surprised at the quality. In the three issues I studied, not a single article concentrated on the common green iguana; instead I discovered a whole world of variety. The writing is excellent, as good as any other herp magazine. The photography inside is all black and white, and a little on the faded side. The covers are nice color photos. A table of contents would help, and an annual index would be a great addition. Sometimes a lot of reprinted material is used, but the editor has done well to include only appropriate and interesting articles. I recommend *Iguana Times* to any lizard lover out there.

Tropical Fish Hobbyist: Since 1989, *Tropical Fish Hobbyist* has had a small section on herpetology. One or two short articles appear each month. They are brief, usually superficial, and often inaccurate. Occasionally you get an article worth saving, like the ones about the gray-banded kingsnake, skinks, or the recent article on the rough green snake. The photography is quite good. It is hard to justify subscribing to *Tropical Fish Hobbyist* solely for herpetological reasons. If you're into fish and reptiles, buy the magazine to read about fish and once in a while you'll be surprised by a good reptile piece.

As this review goes to press, TFH Publications has announced a bimonthly magazine devoted to reptiles; clearly meant as a direct challenge to *Reptiles Magazine*. We will probably witness the first large-scale battle of herpetology magazines. Time will tell if there's enough of us to support two of them.

BOOK REVIEW: REPTILE AND AMPHIBIAN VARIANTS: COLORS, PATTERNS, AND SCALES

By H. Bernard Bechtel. 1995. Krieger Publishing Company, Malabar, Florida. 206 pp. Hardcover, US \$64.50. ISBN 0-89464-862-4.

Breck Bartholomew

Even though I am not particularly interested in color variants, I was excited to receive this book because it contains chapters titled: biology of skin, genetics, chromatophore biology, and the participation of chromatophores in color pattern. Of course there are other chapters but these were the chapters that I was looking forward to reading.

When I received the book I was surprised by the layout. The

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glossary is at the very front of the book and the last 90 pages of the book consist of color photographs without figure numeration. Having the glossary at the front will help those readers who do not explore the book before reading, and grouping the color pages reduces the overall cost of the book, so I can't complain about the overall layout. The photographs, however, are not referenced in the text at all. Even though many of the photos are not discussed in the

text, it would have been helpful to cross-reference those photos that are discussed.

As I began reading the text I was instantly struck with the question, "is this a field guide?" Much of the book is taken up by basic information describing each species discussed (where it lives, what it eats, etc). These descriptions are scattered throughout the book as each species is discussed. In some cases the "field guide" description is considerably longer than the description of the variant.

It seems the author was unable to decide who the audience would be. As a result the book is written in a dichotomy that is disturbing. For example, on page 32 Bechtel writes:

With over 200 species worldwide, many snakes share similar markings, and identification can be confusing. Other characters used by herpetologists to tell them apart include size, presence or absence of fangs, shape of pupils, presence of facial pits, body configuration, scale characteristics, and scale counts.

Except for epidermal melanophores, all snake chromatophores occupy a primary color zone in the upper dermis. Xanthophores and dermal melanophores are concentrated in a narrow zone immediately beneath the epidermis....

While people without any biological or herpetological background will be able to understand much of the book, other parts assume some knowledge of biology and of herps. This dichotomy will be felt mostly in the more technical sections.

Having taught college genetics recitations, I know genetics can be very difficult for biology majors to understand, let alone the layman. The chapter on genetics is only seven pages long, much of which is used to recount the history of genetics. Monohybrid crosses are presented and dihybrid crosses are touched upon. Unfortunately, few people will gain an understanding of basic genetics from this chapter.

I feel that more figures should have been used to help explain the more technical aspects of skin biology and genetics. In addition, the book should present more information. Many aspects of genetics were not even mentioned.

If we overlook the dichotomy of writing style, the overall editing of the book is good. However, a few humorous errors persist. A sentence on page 59 reads, "In 1967, before I realized that true albinos could be albinos and still contain a degree of melanin, we acquired a hypopigmented male black rat snake that was captured in 1974..." And on page 76 the racer (*Coluber constrictor*) is reputed to be "very omnivorous, eating small rodents, birds, frogs, lizards, and even other snakes." In the glossary, however, omnivorous is correctly defined as "including both plants and animals in diet."

The editing of the photos was not as good as the text. Photo quality ranges from very poor to excellent. It is understandable that photographs of specimens with atypical color or pattern could be difficult to obtain and leeway should be given for these photos. Photos of the normal pattern/color phase should be easier to obtain and should be of high quality. With this in mind it is difficult to reconcile many of the photos.

On the bright side, people who like color variants will have a few terms explained and gain a better understanding of why the animals look like they do. The book contains over 200 color photographs most of which illustrate unusual colored or patterned specimens. And I think some people will really enjoy this book.

Personally, however, I am disappointed with this book. Most of the text could have been deleted entirely and replaced with more substantial information. More figures should have been used to illustrate the information presented in the text. Color illustrations would have been helpful too. The photographs should be cross-referenced with the text, and their organization (and quality) could be better. My guess is the average reader will learn enough about chromatophores and iridophores to whet their appetite, but may not really understand the biology of color and pattern. They will also learn a little about monohybrid crosses, but nothing that would help them to discern other types of inheritance.

At \$64.50, this book is certainly overpriced. I can only recommend this book to people who really get excited about color and pattern variations or those who hope to artificially produce unusual looking animals in captivity.



Classified Ads:

For Sale: Captive born hatchlings: Baird's ratsnakes, *Elaphe bairdi*, several bloodlines, \$25; High-yellow leopard geckos, *Eublepharis macularius* \$20.00 and up; fat-tailed geckos, *Hemidactylus caudicinctus* plain \$20, double het. For striped and orange phase \$30. Contact Brent Bisgrove (801) 585-3391

For Sale: Captive born tangerine Honduran milk snakes, *Lampropeltis triangulum hondurensis*. Eggs should hatch the first week of October. Babies will be feeding before they are sold. Reserve yours now, call Hans (801) 673-6149.

For Sale: Captive born Brazilian rainbow boas, *Epicrates cenchria cenchria* and coastal rosy boas, *Lichanura trivirgata roseofusca*. Both clutches are due in October. Breck (801) 752-0297.

Reptiles Magazine Indexed: Locate every reference in Reptiles Magazine from the beginning. Every species mentioned, where the photos are. English and Latin names. Updated Monthly. Single issue \$5.00, full year subscription (4 issues, sent quarterly) \$18.00. Send Check or Money Order to Reptile Index, 7354 Cardigan Circle, Atlanta, GA 30328/404-396-4414.

Wanted: Reptiles and amphibians for use in a high school classroom. I will be happy to pick the animals up if I can use them in my classroom. If you have an animals to donate call or write Ron Call, Richfield High School, 510 West 100 South, Richfield, UT 84701, (801) 527-3477

AMERICAN FEDERATION OF HERPETOCULTURISTS. A nonprofit national membership organization of herpetoculturists, veterinarians, academicians, and zoo personnel involved in the captive husbandry and propagation of amphibians and reptiles. Membership includes the highly acclaimed *The Vivarium* magazine, dedicated to the dissemination of information on herpetocultural accomplishments, herpetological medicine, breeding & maintenance, field studies and adventures, enclosure design and much more. Membership in the AFH is \$26.00. Send information requests to, AFH-News, PO Box 300067, Escondido, CA 92030-0067.

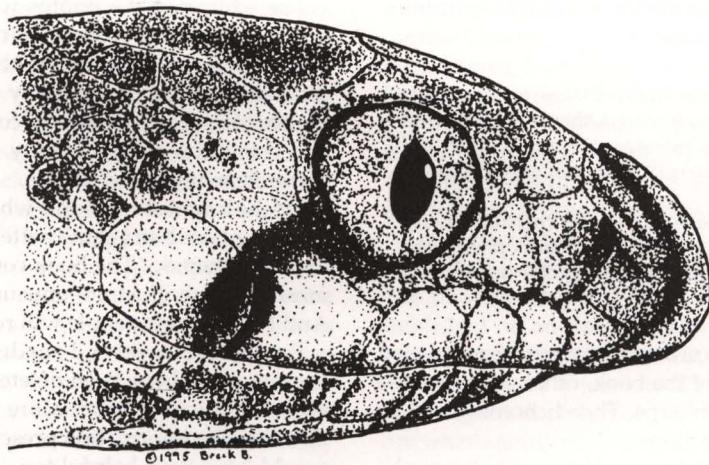
Have a Computer? Call Herp-Net! The herpetology Network is an information service that connects hobbyists, veterinarians, zoo keepers, and students interested in reptiles or amphibians. Callers can read news, submit questions, scan legislative updates, book reviews, and download hundreds of text, graphic, and even audio files 24 hours/day. Free guest access. Ten lines connected to **215-464-3562** for fewer busy signals. Any communicating computer or terminal can connect at virtually any modem speed (high speed access is 215-698-1905 for 14.4) herp-Net is a nonprofit, all volunteer project. For information write: Mark Miller, System Administrator, P.O. Box 52261, Philadelphia, PA 19115-7261 or send e-mail (internet) to: mark.miller@mail.tju.edu

Next Meeting: Tuesday September 26, 1995 at 7:00 pm in the **Hogle Zoo Auditorium**. **Jane Perkins** will discuss the **Utah Division of Wildlife Resources plan to monitor the state's herps**. After the talk there will be a drawing for a book. We are not allowed to bring animals onto the Zoo grounds so there will not be a raffle at this meeting. The regular meeting place is no longer available and we will have to discuss where future meeting should be held.

Future Meetings:

November 16, 1995

Lara Carroll



Western Leafnose Snake (*Phyllorhynchus decurtatus perkinsi*) from Washington County, Utah (BYU #45605).

Drawing by Breck Bartholomew

Western Leafnose Snakes are found in the Great Basin and Colorado Plateau. They are found in desert washes, talus slopes, and rocky areas. They are often found near water, such as streams and springs. They are active during the day and are often seen basking in the sun. They are a non-venomous snake and are a good indicator of the health of an ecosystem.

Western Leafnose Snakes are found in the Great Basin and Colorado Plateau. They are found in desert washes, talus slopes, and rocky areas. They are often found near water, such as streams and springs. They are active during the day and are often seen basking in the sun. They are a non-venomous snake and are a good indicator of the health of an ecosystem.

Utah Association of Herpetologists

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USA

Please note this month's meeting will be held at Hogle Zoo